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ABSTRACT

Begun in 1982, Rural Education Adult Development in Idaho (READI) intends to provide adult learners in rural areas with an opportunity to learn about computers in a way that is both interesting and relevant to their lives. During the 3-year pilot, the project developed and tested a curriculum, designed a method for training people to use the curriculum, and tested a community based delivery system. Curriculum was designed to include activities which foster self-esteem, encourage self-motivation, review basic skills, and enhance problem-solving and decision-making skills. Although READI was piloted through the Idaho Cooperative Extension Service, volunteer community advisory groups selected local peer teachers, organized logistics, and recruited participants. Community advisory committees were charged with developing a strategic vision of how technology will influence the area and implementing strategies for maximizing the positive impact of technological change. Over 600 rural adults enrolled in READI classes and an additional 250 participated in READI sponsored community computer expos. An estimated 40 K-12 teachers have READI materials in their classes, affecting approximately 2,000 students. Most people took the class to improve job prospects; computerize a small business, farm, or ranch; and/or become more knowledgeable about computers to understand what kids are doing in school. (NEC)

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COMPUTER LITERACY AND THE ADULT LEARNER

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Paper presented at the Annual Conference of the National Rural and Small Schools Consortium (Bellingham, WA, October 7-10, 1986).

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COMPUTER LITERACY AND THE ADULT LEARNER

OVERVIEW

Technology is likely to have a great impact on rural communities. Rural people, however, often lack the resources to learn about technology. READI (Rural Education Adult Development in Idaho) offers a unique approach to teaching rural adults about computers. The READI Project is designed to provide access to computer literacy for adults who live where such opportunities are unavailable. The pilot for the project was funded by the Fund for the Improvement of Postsecondary Education and the Idaho Cooperative Extension Service in cooperation with the University of Idaho. During the pilot, the project developed and tested a curriculum, designed a method for training people to use that curriculum, and tested a community based delivery system.

The overall purpose of READI is to provide adult learners with an opportunity to learn about computers in a way that is both interesting and relevant to their lives. Since many adults have been out of school for a long time or have an inadequate math and writing background, the courses do not make assumptions about participants' skill levels. Instead, the curriculum provides an opportunity for participants to review these skills using the computer. In addition, the project is designed to increase problem-solving and decision-making skills while introducing computer applications. Finally, the classes teach about computers by examining the influence computers can have on both individuals' and communities' futures.

The READI curriculum is divided into two parts: Unit I is an introduction to computers and Unit II focuses on computer applications. Classes are taught by local people selected by an advisory committee. Many of these local teachers also teach in public schools and find applications for the materials in their regular classes. The READI Institute in Computer Literacy trains potential teachers in how to use the curriculum while increasing their own skills in using computers and in working with adult learners. Most of the classes are held in public schools. In some cases this arrangement has led to a sharing of software, hardware, and curriculum materials to the benefit of both the school and READI.

RURAL ADULTS AND THE NEED FOR COMPUTER LITERACY

Computers are quickly becoming an everyday item. Children use them at school. Farm families work with them to manage the farm more effectively. Homemakers use them to do financial management. In short, they have become an integral part of our banking and communications systems, and more and more businesses and homes are acquiring them. This rapid proliferation of computer technology has resulted in a demand for computer literacy courses. Such courses are important because many people cannot learn about computers on their own. Either they do not have the necessary equipment and resources or they prefer to learn with someone in a guided setting. Rural people, however,

often lack access to the kinds of continuing education and vocational extension programs that can provide such training. The READI Project provides a means by which communities can fill this void by developing a program that can offer computer literacy training to rural adults.

Rural America in the Information Age

The impact of the Information Age will affect all aspects of American society, but this impact will not be the same for all of us. Indeed, many observers believe that rural America has potentially more to gain, as well as potentially more to lose, from this transition than other groups. Rural communities can gain access to resources and jobs, or they can lose the flavor of rural life. Dillman (1985), for example, maintains that advances in telecommunications could circumvent the one-to-one contact that is characteristic of a rural lifestyle. An individual can do all his/her business and/or job assignments from home with the new technology. At the same time, however, new technology could make virtually any educational opportunity available to the most remote learner; it could bring the marketplace and the workplace to isolated settings, making rural communities more viable.

Technological Gatekeeping

Acquisition of certain skills and access to resources to develop those skills often act as gatekeepers to other opportunities. For example, certain levels of math achievement function as a gatekeeper to most of the higher-paying occupations. Just as an inadequate math background has kept many rural adults from better employment opportunities, lack of access to technological training can also become a gatekeeper (Emery 1985). For this reason, the question of access is essentially one of equity. Equal opportunity for education, training, and employment for rural people necessarily means equal access to training in technology. Not only is it important for rural residents themselves, but knowledgeable people are also critical to the future of rural society because the rapid rate of technological change can either bypass rural areas or contribute to the development of a more resilient and healthy rural society.

The READI Project was developed not only because of the demand for computer education in rural areas, but also because of the concern that rural areas with no access to computer training will continue to be left behind in this age of new technology. Opportunities to learn about computers are important to both individuals and to communities. Such opportunities are particularly important for those areas where the traditional rural industries are no longer able to support large portions of the population. Programs which foster the development of computer-related skills among rural adults can be vital resources in such rural communities. For instance, efforts in both job creation and economic development in these areas are likely to be related to new technologies. As a result, many employers now seek to upgrade existing employees in this technology as well as to hire new employees who are already computer literate. In addition, the computer-literate consumer is increasingly important to the smooth flow of business as more and more establishments add computerized customer services. Computers are also important in education. The role of computers in their own and tneir children's education has encouraged many adults to narrow the generation gap

by becoming computer-literate. Finally, many rural adults seek educational opportunities in computers simply because of the fascination they have for the new technology.

Access to computer literacy programs is not the only problem rural adults face. Often when programs do exist, they do not meet the needs of the students. For example, many existing courses focus exclusively on programming or on learning a specific software package. Teachers can assume that students have high levels of verbal and math skills which results in many people dropping out. Those students who do finish are often unable to use what they have learned because they do not know how to apply that knowledge to existing job and home situations. These experiences show that there is a need for a class which can acquaint adult learners with the computer and its uses as a tool for decision making and information management without making assumptions about verbal and math skills. The READI approach to computer literacy has been designed to provide a relevant and useful introduction to the computer and to computer applications by focusing on the computer as a tool.

OVERVIEW OF THE READI PROJECT

The READI Project began as a spin-off of the New Dimensions Project in 1982. The New Dimensions Project developed curriculum as well as a training model for community leaders interested in increasing women's skills and opportunities. While working with advisory committees in several small communities, we were struck by the interest in computers. Access to training on computers or classroom activities using computers, however, was virtually unavailable for many rural residents. READI applies what we learned from New Dimensions about adult education programs in rural environments and the educational needs of rural adults to the increasing need for computer literacy.

Because the project not only addresses a new need, but also applies a new approach to meeting that need, we were able to secure a 3-year grant providing partial funding for the project from the Fund for the Improvement of Postsecondary Education. The Idaho Cooperative Extension Service and the College of Agriculture at the University of Idaho provided additional support.

The goals of the project were to develop an effective and appropriate curriculum and to pilot a cost-effective delivery mechanism for that curriculum. During the first year of the project the curriculum was developed and the test sites selected. During the second year of the project we tested and modified the curriculum. In addition, the READI State Advisory Board began working on suggestions for making the project self-sufficient at the county level. During the third year we offered the program at additional sites, completed the project evaluation design, and disseminated the project to other areas.

THE READI APPROACH TO COMPUTER LITERACY

The READI approach to computer literacy is multifaceted in that the curriculum takes into account a number of factors. The goal of providing computer literacy is coupled with an understanding of the need for basic skills review, practice in problem solving and decision making, and work/educational referral information. READI also emphasizes an appreciation for rural values and lifestyles. In addition, the READI curriculum is

learner-centered in that it focuses attention on the needs and concerns of the specific students it serves. Finally, since education does not take place in a vacuum, the READI Project is designed to discuss implications for the future and to enhance critical thinking skills so that rural adults may play a more pro-active role in the Information Age.

An educational program designed to bring computer literacy to rural areas must address the factors that prevent rural adults from entering the computer age. Access is, of course, a critical factor because many rural people live too far from existing programs, and these programs have neither the resources nor the expertise to conduct courses in more isolated areas. Further, these rural communities cannot by themselves provide educational opportunities for their residents. These external factors of distance, geographic isolation, poverty, and lack of resources can be overcome. The READI Project provides a model for using local resources and expertise in developing low-cost courses in computer education for adults.

In addition to external factors, internal factors such as poor esteem, lack of basic skills, math anxiety, and inadequate communication skills also prevent rural adults from taking advantage of whatever educational opportunities may exist. Local ownership and control of the program tend to break down barriers for adults who want to attend computer courses. The READI curriculum has been designed to include activities which foster self-esteem and encourage self-motivation as well as those that review basic skills. Each of the elements described below plays a key role in fostering a positive learning experience.

The READI curriculum design is intended to enhance problem-solving and decision-making skills, as well as to teach people about computers. Actual class activities are designed with two principles in mind. The first principle is that adults learn best by doing, particularly with activities that have a direct application to some part of their lives. For hands-on activities to be successful, however, the instruction must go beyond drill and practice and involve the students in the discovery of knowledge. Such activities will also enable participants to retain what they have learned and to integrate new knowledge more easily into everyday life.

Secondly, interaction among peers can provide a very effective context for learning. Participants increase each other's understanding and self-confidence by sharing feelings and successes, by comparing problems and solutions, and by teaching each other. Since one of the goals of READI is to provide a learning experience which empowers participants to take hold of new opportunities, it is essential that the courses provide a setting where ideas can be exchanged and individual goals can be enhanced.

The Learner-centered Classroom

The curriculum has been designed with a certain pedagogical approach in mind, that learning is a process in which the learner must be actively engaged. This curriculum does not support a technical approach to implementing computer literacy either in content or in method, but rather approaches computer literacy from a problem-solving focus with an emphasis on group interaction. The design reflects a belief in the need to recognize a variety of expertises and to share information in a meaningful way so that learning is both an exciting experience and a new discovery.

Recent reports on the state of education in the United States have focused on the learner-centered classroom as the best method for teaching critical thinking skills and problem solving (Bennett 1985). The learner-centered classroom provides learning experiences which revolve around the needs of the learner and which place the learner at the center of the learning process. Activities that foster a positive approach to the learning process are critical to learner self-esteem and self-motivation.

Useful and Relevant Class Experience

One of the problems many learners have is that they can learn some things well in class, but not be successful in applying the skill to their own lives. Peer teachers are encouraged to use examples taken from the everyday life experience of those taking the class rather than a canned example taken from a text. In addition, the suggested agendas include an activity at the end of class where participants can reflect on what they learned and how they will use it. The last sessions of both Unit I and Unit II also include activities that encourage individuals to develop a plan for how they will implement what they have learned. For some who want only to be able to converse better with the younger generation about computers, this is not a complicated activity; but for the majority of our participants who want to find new jobs or computerize their farm or business, this activity provides them with an opportunity to develop a plan of action and to identify a first step.

READIness Skills for Computer Users

Using the computer in problem-solving situations also provides an opportunity to review basic skills. Since many rural adults did not finish high school, had an inadequate high school experience or simply have allowed these skills to get a little rusty, it is essential to provide some review and instruction. We cannot produce computer-literate adults without also dealing with illiteracy in other basic areas. While the READI course does not substitute for an ABE or GED program, the curriculum has been written with attention to this need. Thus, reviews of math and writing skills necessary for specific types of problems are included. Clearly, if we are to empower adults by becoming computer literate, we must address those skills that help individuals to write correctly, to estimate answers and to use correct formulas.

The READI Definition of Computer Literacy

The question of what constitutes computer literacy is a difficult one, made more so by the currently changing definition of literacy itself. Literacy was once defined by the ability to write one's name. Since then it has been redefined several times as more and more complex skills are required to function effectively in our society. Some educators now define literacy less in terms of specific skills and more in relation to the issue of empowerment, for example: What are the skills necessary for individuals to increase their control over their own lives and to function independently? This new focus on literacy has also meant more emphasis on critical thinking and reasoning skills as well as on problem solving and decision making (Chall 1984).

As more and more colleges and high schools add computer education to their requirements, and as more and more jobs involve computer-related skills, literacy is being redefined to include computer skills. Indeed, the report, "A Nation at Risk," stated that "effective participation in our 'learning society' requires each person to be able to manage complex information in electronic and digital form. A basic objective of education is for each student to learn how to identify needed information, locate and organize it, and present it in a clear and persuasive manner" (quoted in Wilson Library Bulletin, March 1984, 472). The READI approach supports both the critical literacy definition of literacy and the view that computer skills are now a necessary component of what it means to be literate in our society.

Despite agreement that computer literacy is quickly becoming a necessary skill, the definition of computer literacy is still a subject of hot debate. Most people now agree that computer literacy is something more than knowing how to turn on the machine and boot up software. Most also agree that computer literacy should entail some understanding of the social, political and economic impacts of the new technology on individuals, as well as on the community and the nation. Also at issue is the level of technical expertise that should be included in a computer literacy curriculum. While some argue that people drive cars without knowing a thing about the mechanical parts of the automobile and can therefore use a computer similarly, others argue that some technical background is essential to empowering people to be effective computer users. In particular, programming skills are at the heart of the controversy. With the development of more high level languages and more sophisticated software programs, the argument that everyone should know how to program in at least two languages has lost ground. However, one question remains: Should programming skills be included in a computer literacy curriculum? The READI curriculum includes several sessions on programming skills for the following reasons:

- Students experience a great sense of control over the machine when they can successfully run a short program of their own.

- Teaching people some programming skills helps them learn about how the computer handles information and performs tasks.

- Teaching programming skills helps develop problem-solving abilities.

- In our post-evaluations, learning about programming rated very high among participants.

Since the amount of time spent on programming is quite small and the skills very basic, it is perhaps more true to say the READI curriculum teaches about programming rather than actual programming itself (Fawcette 1984).

The Computer as a Problem Solving Tool

Central to the READI approach to computer literacy is a focus on the computer as a tool. Just as teaching someone how to use a hammer or sewing machine involves much more than just how to work the tool, using a computer also means that the person needs to learn how to apply the tool. Despite the fact that people will apply computer power to a wide range of situations, it is possible to focus on common situations, such as family budgets and mailing

lists, in order for students to learn how to use the computer as a tool. In addition to focusing on common applications, each participant is encouraged to apply a variety of computer tools to situations in their own lives. In previous READI classes, for example, a small town city clerk experimented with putting her records on a data base, a number of people looked at keeping their small business records on data bases, and teachers made electronic record books.

In summary, the READI approach to computer literacy includes the following:

- Examining the social, political and economic impact of computers on the future of individuals, communities, and the larger society.

- Reviewing the skills necessary to apply the computer as a tool, including problem solving, decision making, math, writing and information organization.

- Helping participants gain confidence in using the machine by learning computer terminology and about programming.

- Creating an opportunity for participants to learn how to manipulate and use data as well as to understand how computers store and use data.

- Empowering individuals to make better decisions about their future and the role of computers in that future.

The READI curriculum guidelines presented in this manual have been designed for a maximum of flexibility, recognizing that no two classes will be the same.

Making the READI Opportunity Available to Rural Adults

The READI Project has been successful because it provides for maximum flexibility. Another reason for its success is that it places some of the responsibility, as well as some of the risk, on rural communities. READI provides an opportunity to expand local expertise and resources in both computer-related activities and leadership development. READI was piloted through the Idaho Cooperative Extension Service and the READI Project became one of several volunteer-run projects in those counties. The same method of organization could be used in continuing education or community education programs.

Local Ownership

The READI Project has been developed on the assumption that local communities or county committees will take responsibility for running the project on the local level. University extension or continuing education programs share in that risk by providing additional expertise, help with networking, and access to a support person. This arrangement of shared responsibility and risk results in a program with local ownership and control and expanded resources.

The READI community advisory groups are organized to oversee the READI Project on the local level and, as such, play a vital role in the program's success. The committee is an essential link in the transition from a generic

statewide project to an effective local program. The committee makes this transition possible by overseeing the selection of local peer teachers, organizing logistics and recruiting participants. In addition to adapting READI to local needs and resources, the committee also participates in evaluating the project's successes and problems. The committee is also responsible for developing useful and up-to-date referral information for READI participants. By researching opportunities, the committees help READI participants not only see the READI experience as a stepping stone to other activities, but also to use these skills to make a contribution to the community. The advisory committee uses the experiences of READI participants and their own knowledge of the community to plan future directions for the project in their location.

Arranging for classes is a common problem continuing educators face in developing programs for rural adults. Not only are there problems in getting the program out to isolated areas, but there are also problems in finding the right time. Rural adults are generally busy with family and community responsibilities. Educational opportunities must be worked into these schedules carefully. In addition, seasonal factors such as harvest, hunting season, winter roads, etc., influence how successful a program will be in getting students. Often programs brought to rural communities have a poor turnout not because of a lack of interest, but rather because of a conflict in schedules. Because the local committee has responsibility for scheduling classes, READI has not had these problems.

In addition to administering the programs at the local level and developing relationships with local resource people, the community advisory committee is also charged with developing a strategic vision of how technology will influence the area and implementing strategies for maximizing the positive impact of technological change. Since rural areas are known for the way they cherish traditional values, the committee must mediate between the needs for constancy within the community and the influence of change. For each community, as with each individual, this balance is unique. What is acceptable in one area may not work in another. The READI approach provides for flexible schedules and program designs, allowing classes to differ from community to community. The local committee monitors the success of the courses based on local criteria. The central office or support person monitors the quality of the instruction.

The actual classes are facilitated or taught by peer teachers. When possible, these peer teachers receive training in teaching computer literacy to adults. This training may be available specifically for READI participants through the Cooperative Extension Service or indirectly through continuing education classes or the State Computer Teachers' Association.

Peer teachers are chosen not only on the basis of their understanding of computers, but also because of their involvement with adults and their interest in educational or job training activities.

Shared Expertise

By providing resources to local people, the project helps to foster local expertise, both in computer education and in leadership development. The READI Project is, at heart, a grassroots-oriented program encouraging active

and meaningful participation by everyone in all aspects of tne program. Part of the success of the project has been the development of local ownership in the program and, hence, local investment in its success.

Since one of the problems in educational outreach historically has been the identification of qualified personnel, a key component in sharing expertise has been the training and support of local peer teachers by the central office. The project found that there are many talented and knowledgeable people in rural communities who are interested in supporting adult education. However, many of these people have had no experience working with adult learners or haven't the time to design a course. With support from the state office and an existing curriculum, such peer teachers can expand their own expertise and provide an important and continuing resource to the community.

Since the goals of the project are to enable rural communities to cope more effectively with the Information Age and to empower individuals to have more control over how their lives will be changed, developing local leadership skills in the planning and development of programs and in computer technology is critical to the success of the program. The fostering of such skills and expertise on the local level allows communities to make better decisions related to the impact of new technology by applying this expertise to local conditions and concerns, something experts from the outside have difficulty doing.

PARTICIPANT CHARACTERISTICS

The majority of READI participants were women. Some classes were all women and some about half and half. The following charts break down participation by sex and by occupation.

Male to Female Ratios*

	Unit I		Unit II	
	M	F	M	F
84/85	22	79	14	38
85/86	43	138	12	39
Totals	65	217	26	77

Participant Occupation*

Office workers	48
Managers	8
Professionals	43
Education/library	35
City/county employees	7
Skilled craftspeople	12
Mail carriers	3
Bookkeepers	14
Farm/ranch operators	22
Self-employed	8

*Information collected for 62% of those registered for classes.

Housewives	74
Students	5
Service workers	33
Retired workers	1
No answer	72

READI attracted a variety of adults to the program. Most people took the class for a combination of the following reasons: improve job prospects, want to computerize small business, farm or ranch, and/or want to become more knowledgeable about computers in order to understand what kids are doing in school.

For many people this was a first experience with postsecondary education and a kind of trial effort to see if they wanted to continue taking classes. We predicted that a successful READI experience would be a stepping stone to other educational or vocational experiences. Data on 64% of participants indicates how successful the project was in encouraging people to continue learning.

PARTICIPANT PLANS FOR ACTIVITIES AFTER TAKING READI

Buy a computer	15%
Use a computer for tasks at home	11
Use a computer for tasks at work	13
Use a computer for home business or farm purposes	9
Use a word processor	3
Help children learn about computers	1
Look for a job where I can use my computer skills	11
Teach others about computers	3
Take more classes	27
Join a users' group	4
Other	1
No answer	1

READI graduates are using their skills in a variety of ways. In a survey taken 8 weeks after the classes finished, during the first year 57% of participants reported they were currently using their skills in areas such as evaluating and purchasing hardware and software, applying new skills to the workplace, and learning to use the computer to more efficiently manage a farm or ranch. One year later, the original group of READI graduates reported that, as a result of the course, they had:

Changed jobs	9%
Entered the labor market	9
Taken another class	22
Bought a computer	9
Other (got a raise, etc)	19
No response	31

(Percents may not add to 100 due to rounding)

PROJECT OUTCOMES

During the pilot period the project successfully developed and implemented a curriculum for rural adults. This curriculum was reviewed by experts from the Lawerence Hall of Science at UC Berkeley, the FIPSE Technology Study Group, and the University of Idaho College of Education.

Over 600 rural adults have enrolled in READI classes and an additional 250 have participated in READI sponsored community computer expos. We estimate that 40 k-12 teachers have used READI materials in their classes, affecting approximately 2000 students.

READI has also had an impact on the communities in which it has offered classes. Two counties did a survey of computer use in their area. Two other counties have developed community education and/or continuing education programs for rural learners as a result of the READI experience. Several counties have participated in economic development projects.

Potential READI Spin-offs -- In addition to sponsoring READI classes, county committees have expanded their interests and activities to include many follow-up activities and spin-off programs. Some of the ideas of interest to these groups include:

- County computer expos
- Computers and economic development workshops
- Community computer user groups
- Joint READI/4-H "each one teach one festival"
- Joint READI/school district training sessions
- Computers and farm management conference
- Parenting in the computer age workshops
- Computers and home management workshops
- County fair computer displays
- Computer and small business management programs

Developing Partnerships with Others

A key theme for education in the 80's is the formation of partnerships. The READI Project is essentially a partnership between an educational institution and community groups. The project also provides a means for working with other agencies and institutions. For example, many school districts have benefited because one of their teachers is a READI instructor. This instructor is able to bring new ideas, materials, and resources into the school as a result of the READI connection. READI benefits because most of the courses are taught at schools. In other partnerships, the Cooperative Extension Service and vocational education programs in small business management and farm management provide follow-up to the READI classes. Local businesses have sent employees to participate in READI and as advisory committee members. Finally, READI graduates have often returned to school for credit classes.

SUMMARY

Idaho, like many other states with large rural populations, must come to terms with the increasingly desperate economic and social problems resulting from high levels of unemployment and deindustrialization, lack of mobility, declining educational resources and technological illiteracy. Computer literacy programs are a resource for dealing with change because they provide resources to break this vicious cycle of poor educational background, high unemployment and increased social problems. The success of the READI Project illustrates that bringing educational opportunity to rural communities can impact both individuals' and communities' futures.

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